Abstract

The invention relates to a transparent object carrier for use in optical microscopy, comprising a carrier side for the object to be observed microscopically and a visible linear grid for examining the latter. According to the invention, the linear grid is configured on a film that is applied to the side of the object carrier opposite to the object side.

Description of DE19952139

The invention relates to a transparent object carrier for optical microscopy, with a carrier side for the microscopy object and a visible linear grid for comparison.

The object carrier is to be used particularly for the microscopic examination of biological objects.

In connection with counting chambers for microscopic counting of cellular elements, glass carrier slides are known as object carriers and are provided with a linear grid. The lines are formed directly in or on the glass material. Observations and measurements must be conducted under sterile conditions.

A glass covering plate for an object carrier is known from US 5,349,436. Using a laser process a linear grid is etched directly on the glass material on the side facing the object carrier.

An object carrier for optical microscopy is known from DE 41 32 379 C2 whereby a linear grid is stretched between two plates so as to be waterproof against fluids.

And finally, DE 37 38 982 C2 describes a microscopy object carrier that includes grid recesses sealed by a self-adhering film.

It is the task of this invention to provide a new object carrier for microscopic examinations that may be manufactured with less expense than known object carriers.

The object carrier solving this task is characterized in that the linear grid is formed on a film mounted on the side of the object carrier facing away from the object side.

Based on this invention solution, an object carrier with a linear grid may be produced simply and directly at the microscopy location. Such an efficient object carrier with a linear grid may thus be advantageously produced in that it may be used as a coordinate field. For example, for long-term, repeated observations of a cellular culture, repeated positioning of the cellular culture onto the object carrier, i.e., the positioning within the field of view of the microscope, would be simplified. The foil mounted on the side of the object carrier facing away from the microscopy object need not be sterile.

In a preferred implementation of the invention, the film adheres to the object carrier by means of friction and/or an electrostatic charge, or is adhered to the object carrier whereby preferably an adhesive is used to moisten both the object carrier slide and the film completely to avoid the formation of smears. The film is preferably a plastic film that is transparent and that allows both top lighting and inverted microscopy.

In another advantageous embodiment of the invention, the film may be a self-adhering film, particularly one that may be separated from a film carrier base. Such a multi-layer film may advantageously be stored long-term, and may be processed at low expense as required.

It is useful for the film to be removed from a film supply roll whereby the film is then cut from the roll. It would be further conceivable for the film to be torn off the roll using a perforation.

In another embodiment of the invention, the film may be formed of several layers, and may possess a protective layer for the side of the object carrier facing away from the object that is removable from the rest of the film. In such case, the film may be easily handled during attachment to the object carrier slide.

Any contamination from fingerprints that might interfere with microscopic examination may be easily removed by removing the outer film.

In another advantageous embodiment of the invention, the film and the object carrier are matched based on their thermal coefficients. Deformations of the film with respect to the carrier slide, e.g., from warming from an irradiation device, that might lead to smear formation are thus avoided.

The object carrier may be a conventional rectangular glass slide as used as an object carrier. Object carriers may, of course, be formed of any vessel containing the microscopy object.

Materials for the object carrier may be glass or plastic, for example.

The object carrier should be a pre-weighed product. Because of the creation of the linear grid at low expense, there is no economic reason for multiple use.

The invention will be described in greater detail using an embodiment example and illustrations referring to it, which show:

Figure 1 schematic view of a microscopy device based on the invention;

Figure 2 an object carrier used in the microscopy device per Figure 1 that is attached to a film based on the invention;

Figure 3 film provided in the microscopy device per Figure 1 for attachment to the object carrier; and

Figure 4 top view of a cutout section of the film from Figure 3.

A schematically represented lens of a microscope 1 possesses an optical axis 2. The microscope lens 1 magnifies microscopic objects 4 positioned on an object carrier 3, e.g., cellular cultures.

The object carrier 3 in the illustrated embodiment example involves a thin glass slide as is conventionally used in illuminated microscopes.

A film 7 onto which a coordinate grid 8 has been printed is adhered, as arrows 5 and 6 show, to the object carrier on the side of the object carrier 3 facing away from the object being examined. An adhesive is used to attach the film 7 made of transparent plastic to the object carrier 3 that uniformly moistens both the object carrier 3 and the film 7 so that smear formation distorting the optical image of the object and of the coordinate grid is avoided. The film 7 adhered to the object carrier 3 is self-adhering, and is removed from a film carrier 9 shown in Figure 3 before attachment to the object carrier 3.

The partial piece of film carrier 9 and film 7 shown in Figure 3 may be unrolled from a supply roll on which individual sections are separated by means of perforations, and from which they may be torn.

As Figure 4 shows, the coordinate grid imprinted on the film 7 includes large square fields marked with digits and small letters, and small square fields marked with digits and capital letters. Both the small and the large fields are square. In the illustrated embodiment example, the length of a side of the large fields is 10 mm, and the length of a side of the small fields is 1 mm. The section shown in Figure 4 approximately corresponds to the object field formed by the imaging device 2. The coordinate grid thus allows a targeted search for an examination object located at a random location on the object carrier if its coordinates are known.

Claims of DE19952139

1. Transparent object carrier for optical microscopy, with a carrier side for the microscopy object and a visible linear grid (8) for its review, characterized in that the linear grid (8) is formed on a film (7) that is mounted on the side of the object carrier facing away from the object.

2. Object carrier per Claim 1, characterized in that the film (7) is adhered to the object carrier frictionally, electrostatically, and/or adhesively.

3. Object carrier per Claim 1 or 2, characterized in that the film (7) is formed as a self-adhering film and is preferably removable from a supply roll as a multi-layer film by tearing.

4. Object carrier per one of Claims 1 through 3, characterized in that the film (7) preferably consists of a transparent plastic.

5. Object carrier per one of Claims 1 through 4, characterized in that the thermal expansion coefficient of the film (7) is matched to that of the object carrier.

6. Object carrier per one of Claims 1 through 5, characterized in that the object carrier is of glass or plastic, and is preferably implemented as a single-use object carrier.

7. Object carrier per one of Claims 1 through 6, characterized in that the object carrier is formed as a vessel to accept the microscopy object.

8. Use of a film possessing a linear grid to produce a transparent object carrier per one of Claims 1 through 7.

Two pages of Figures.

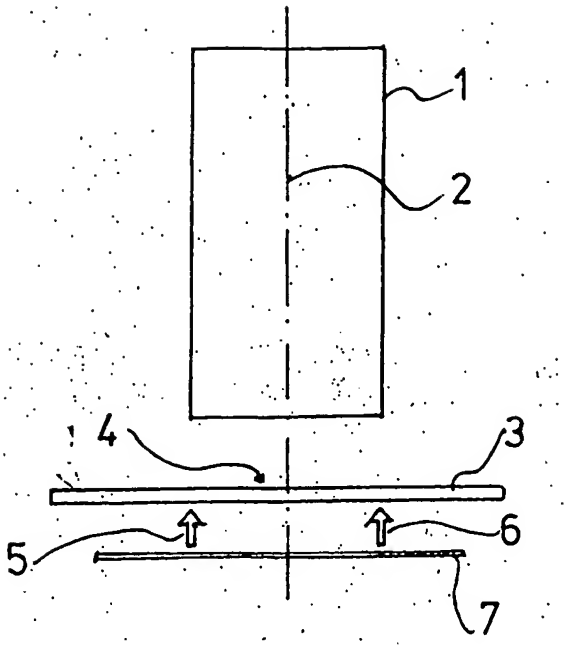

FIG.1

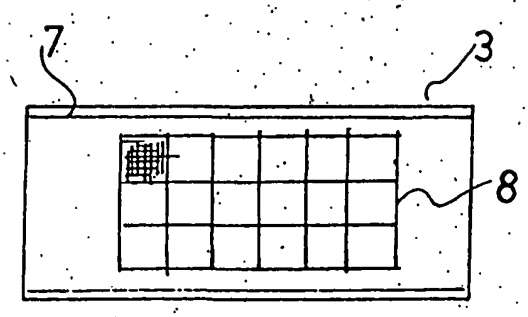

FIG.2

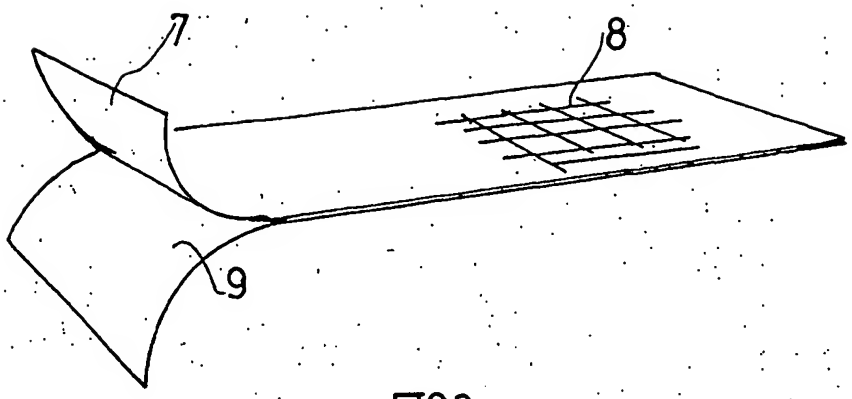

FIG.3

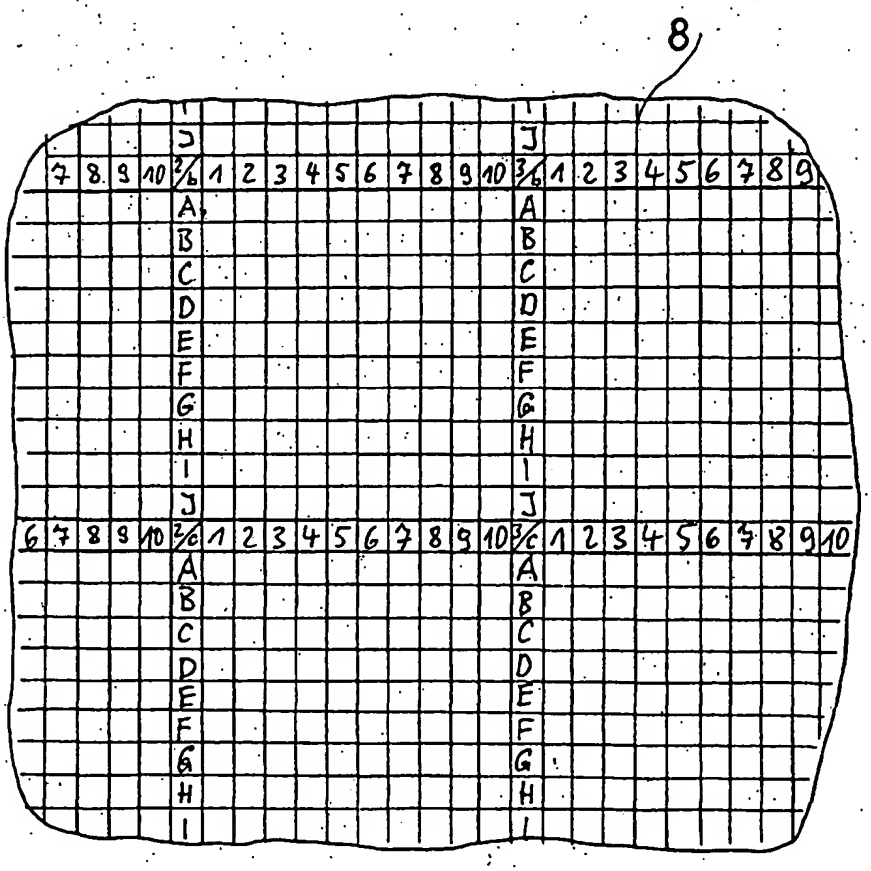

FIG.4